US006094869A

United States Patent [19]

Magoon et al.

[11] **Patent Number: 6,094,869**

[45] **Date of Patent: *Aug. 1, 2000**

[54] **SELF-RETAINING CONFIGURABLE FACE PLATE**

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[73] Assignee: **Kawneer Company, Inc.**, Alcoa Center, Pa.

[*] Notice: This patent issued on a continued prosecution application filed under 37 CFR 1.53(d), and is subject to the twenty year patent term provisions of 35 U.S.C. 154(a)(2).

[21] Appl. No.: **08/771,941**

[22] Filed: **Dec. 23, 1996**

[51] **Int. Cl.**[7] **E05F 11/00**

[52] **U.S. Cl.** **49/460**; 70/450

[58] **Field of Search** 49/460, 503, 394; 70/450, 461, 466, 417, 416, 418; 292/346

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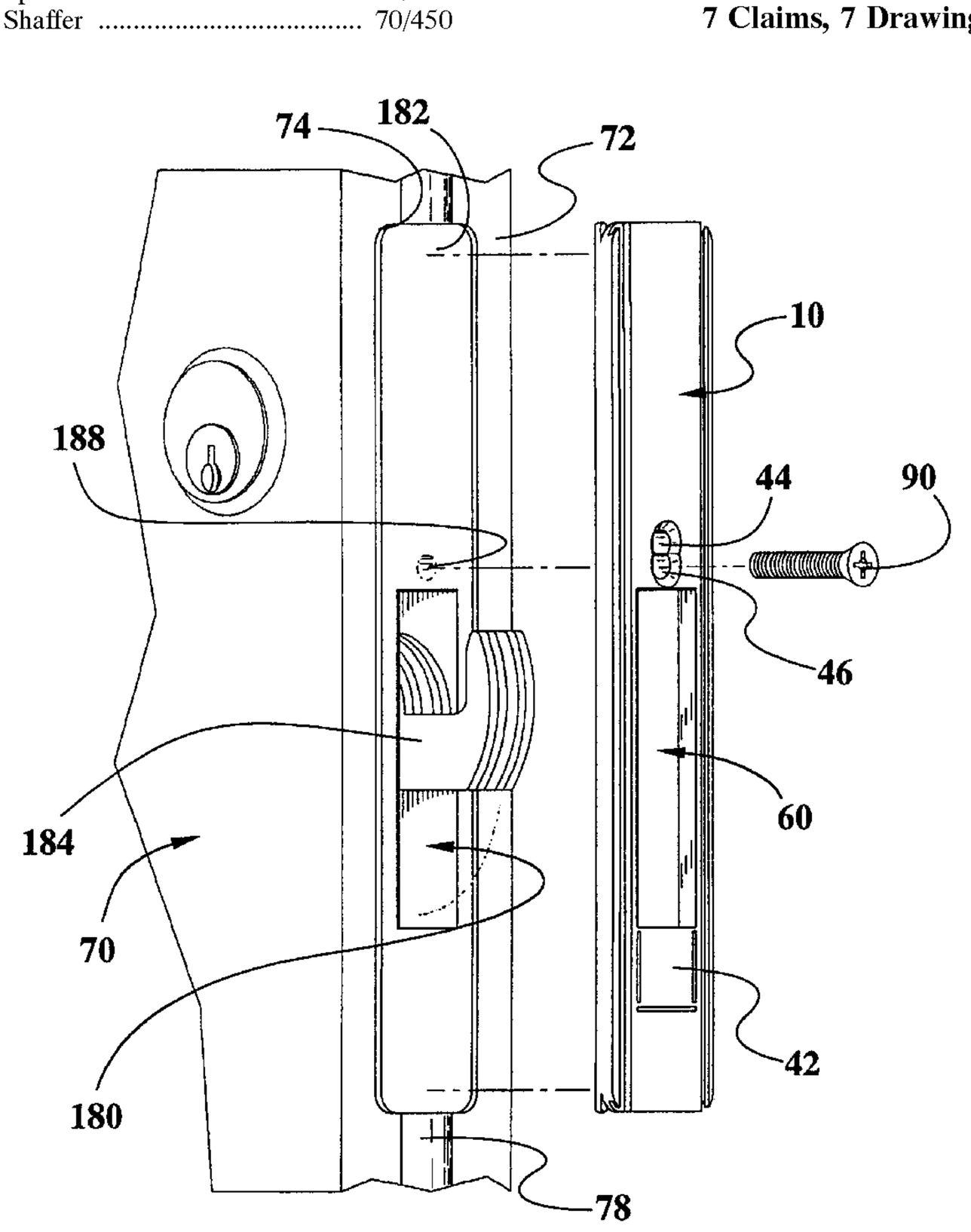
Primary Examiner—Jerry Redman
Attorney, Agent, or Firm—Jones & Askew, LLP

[57] **ABSTRACT**

A face plate is disclosed for concealing the exposed edge of a lock mechanism when installed within the lock stile of a door. To accommodate the plunger and deadbolt of the lock mechanism, the face plate comprises a plurality of separation lines defining removable portions or "knockouts" corresponding to various lock configurations. Depending upon the configuration of the lock mechanism being used, a corresponding one or combination of the removable portions can be removed to accommodate the particular lock mechanism. In addition, the face plate comprises tabs at the upper and lower edges which hook beneath the vertical edge wall of the door stile adjacent the upper and lower ends of the opening within which the lock mechanism is installed. The tabs hold the upper and lower edges of the lock plate with the opening and can either reduce the number of screws required to secure the face plate to the door or can eliminate the need for screws altogether.

7 Claims, 7 Drawing Sheets



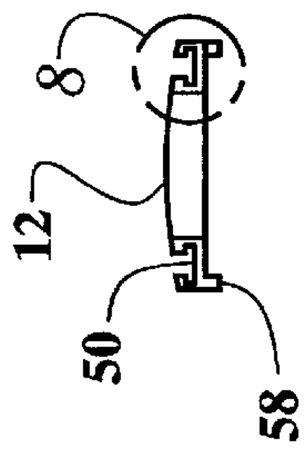


Fig. 5

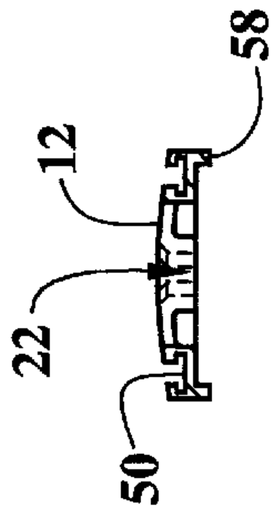


Fig. 6

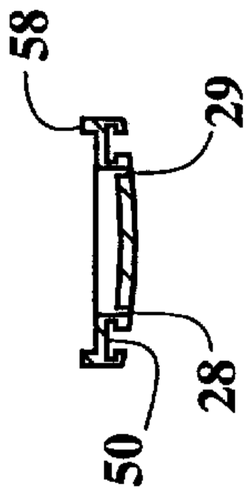


Fig. 7

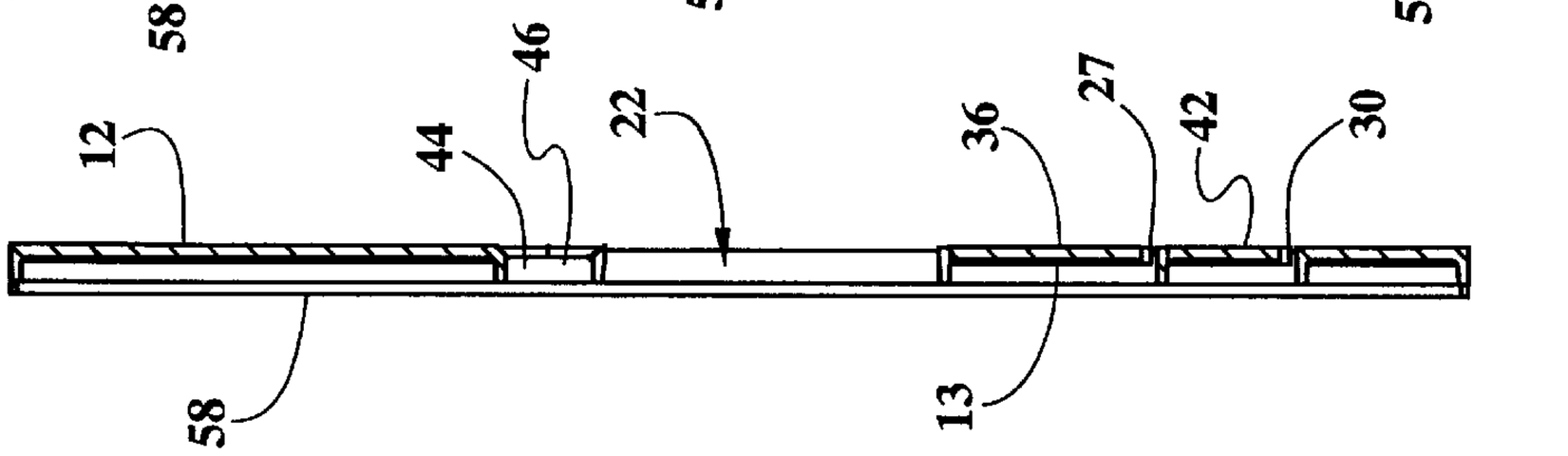


Fig. 4

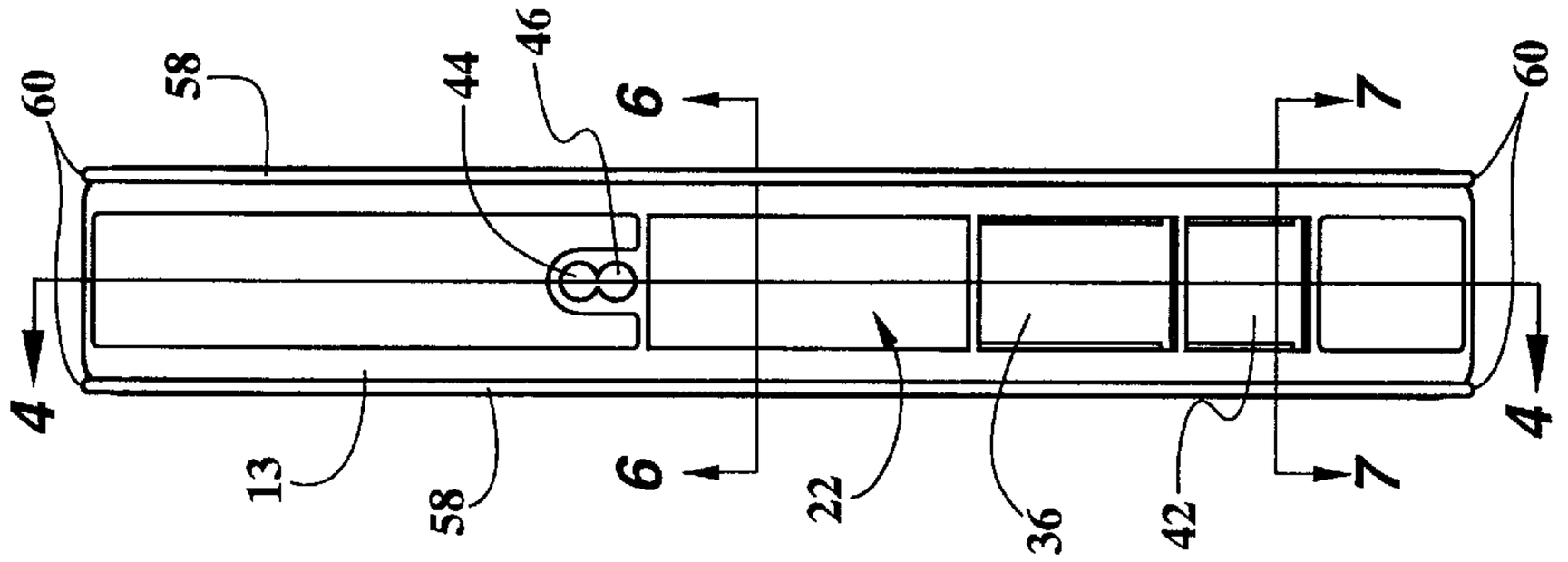


Fig. 3

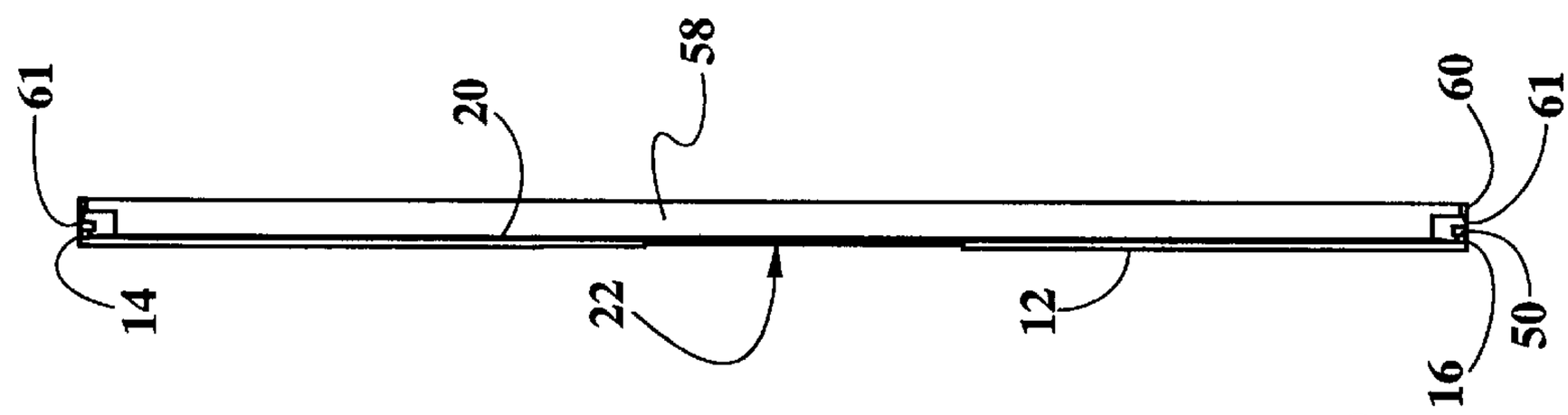


Fig. 2

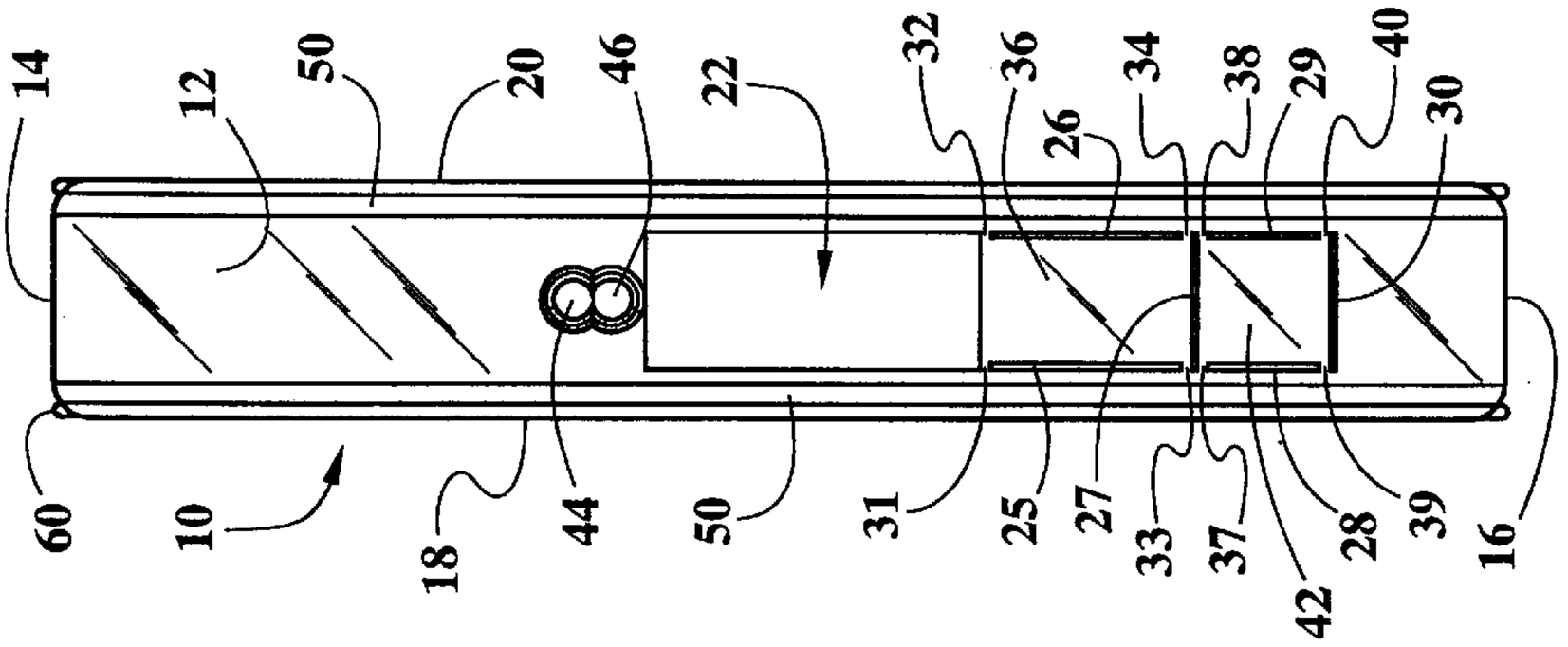


Fig. 1

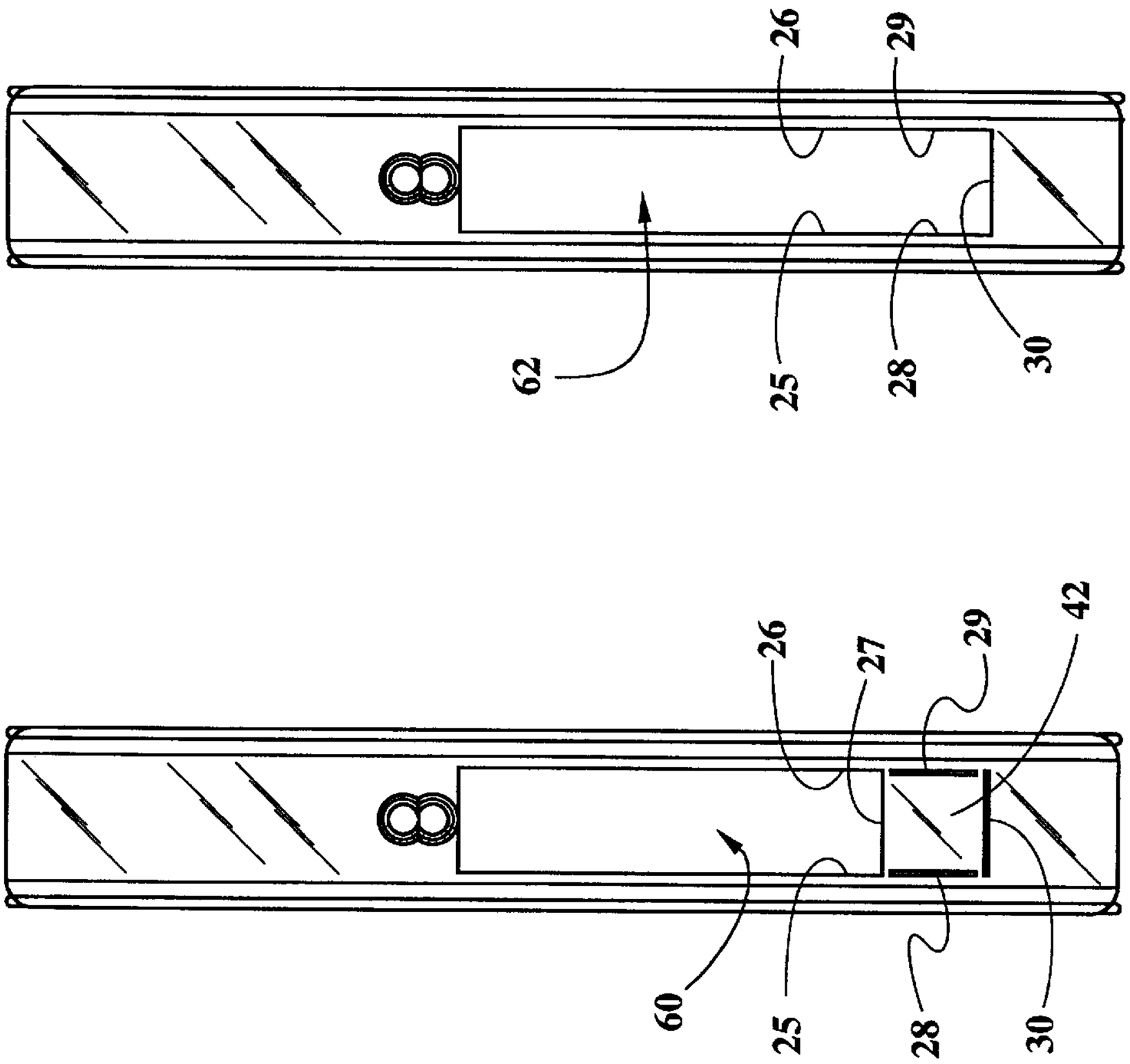


Fig. 12

Fig. 11

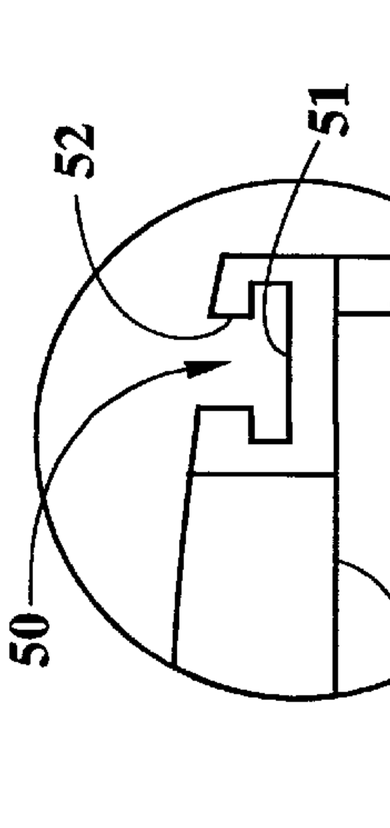


Fig. 8

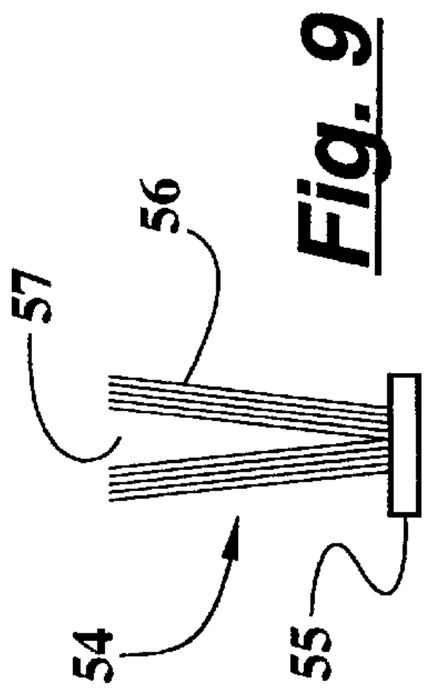


Fig. 9

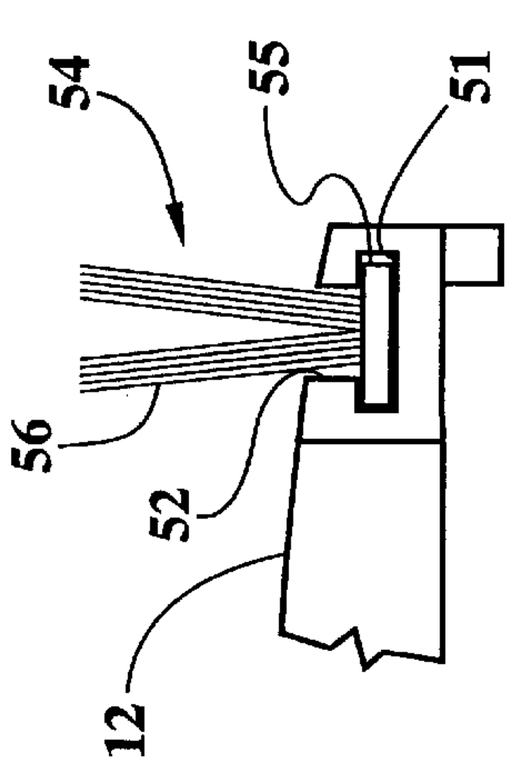


Fig. 10

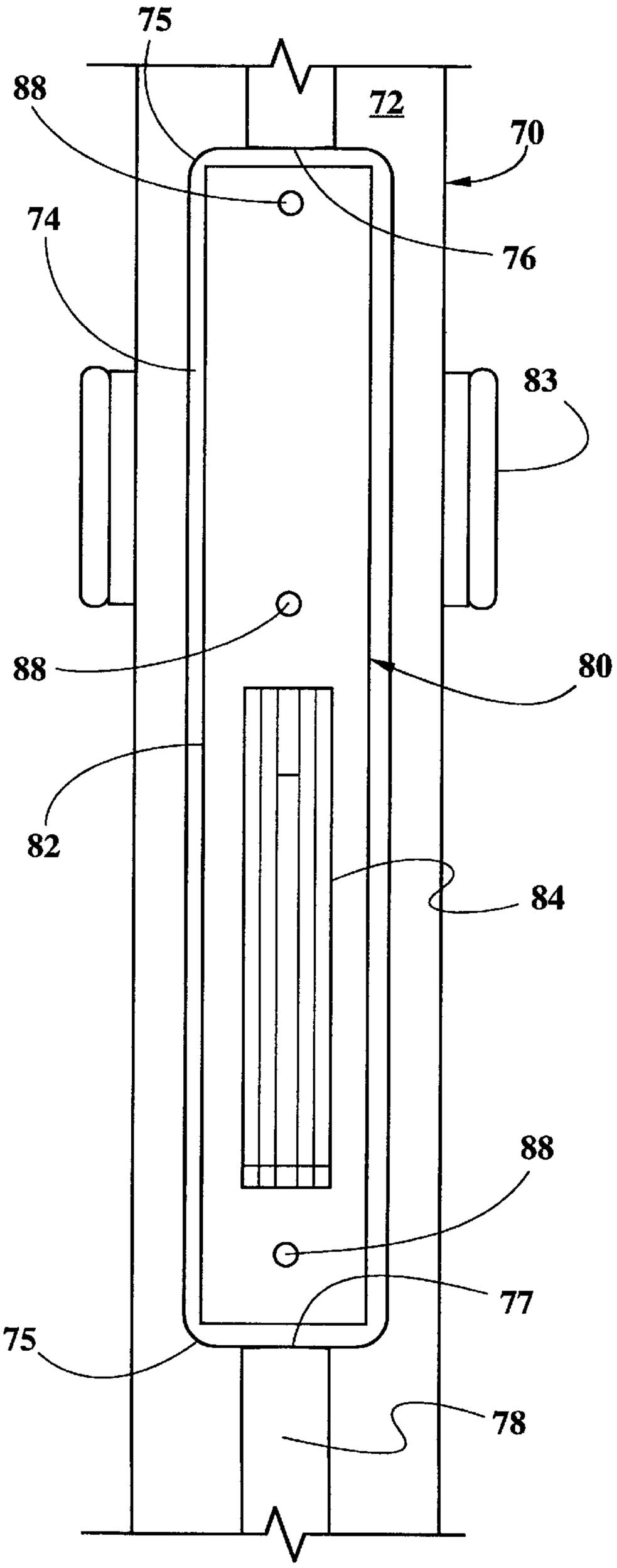

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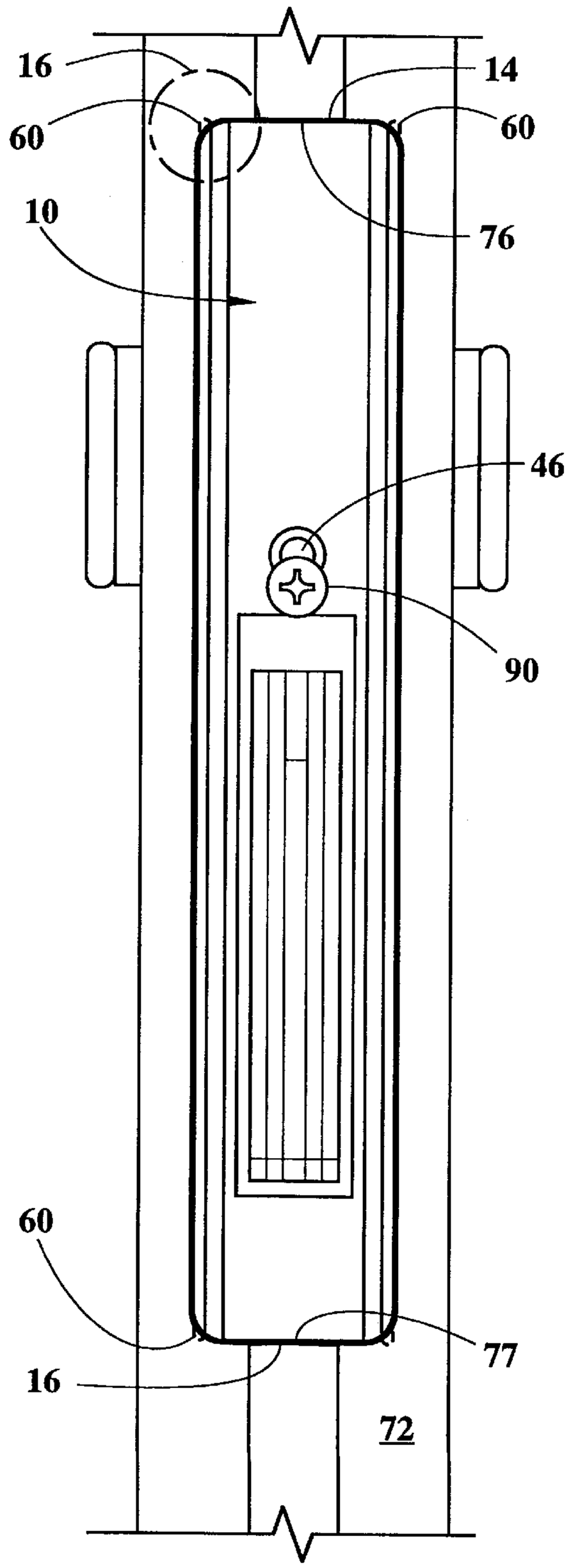
Fig. 13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14
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60
10
76
46
90
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77
16
72

Fig. 14

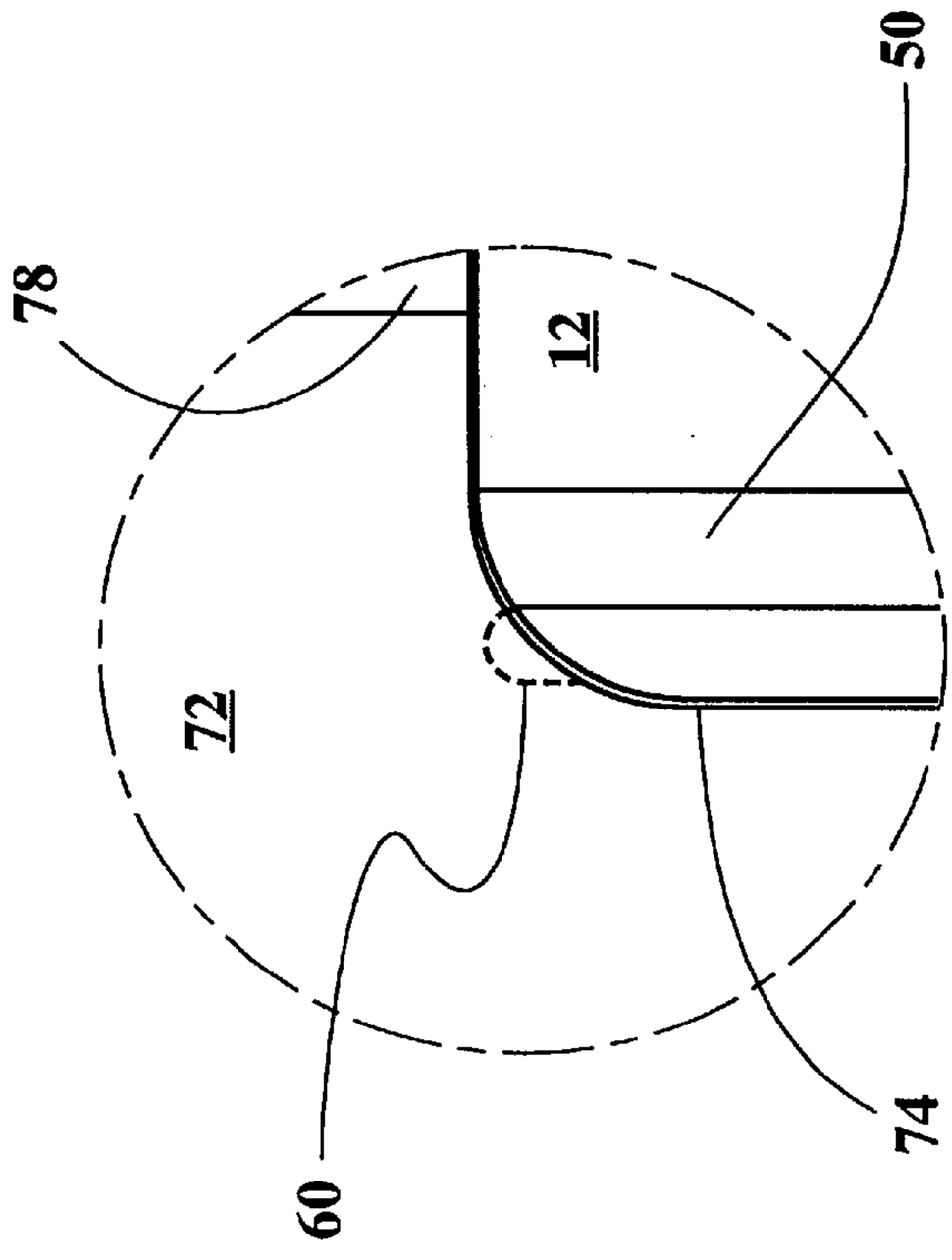


Fig. 16

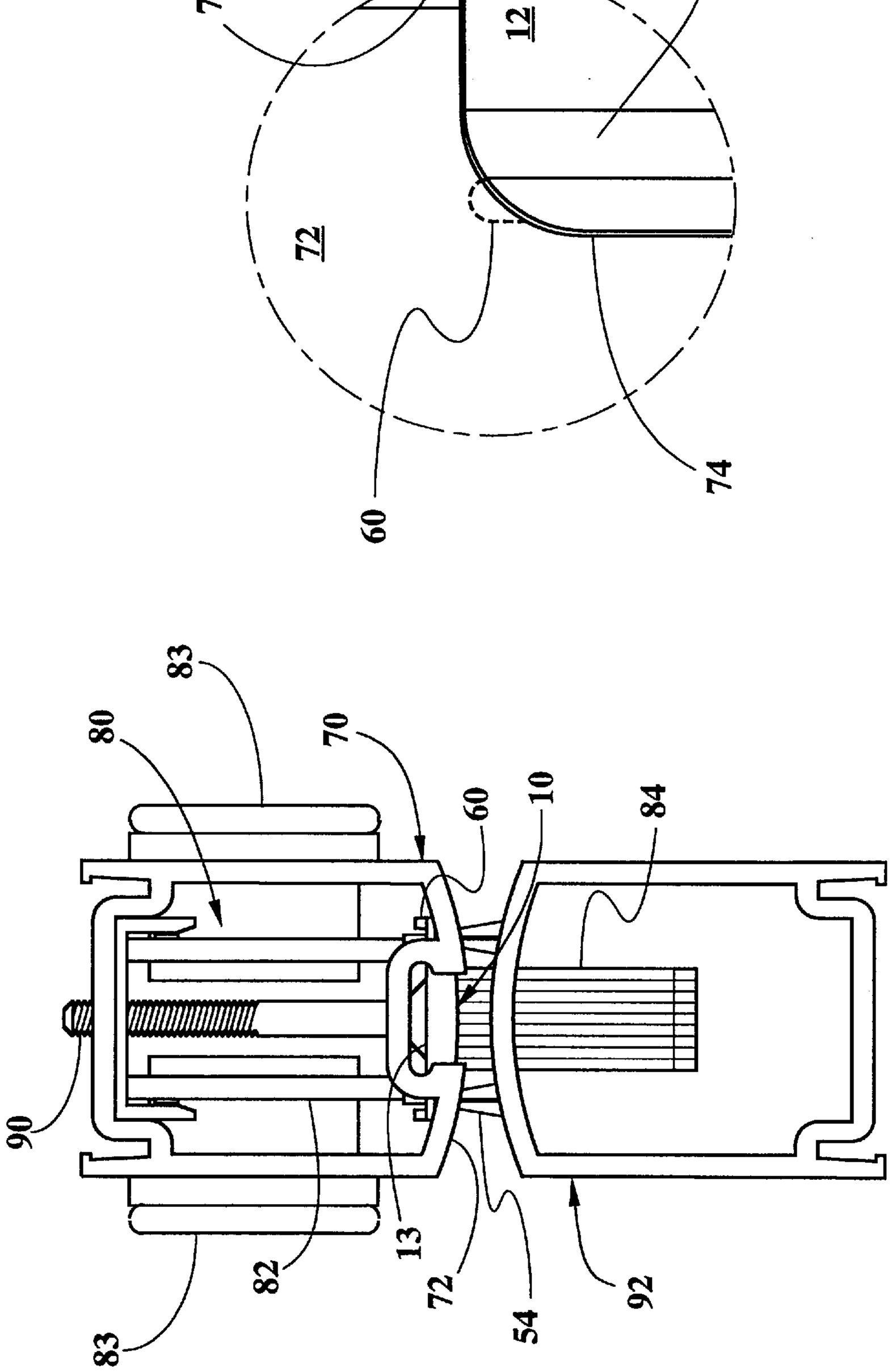


Fig. 15

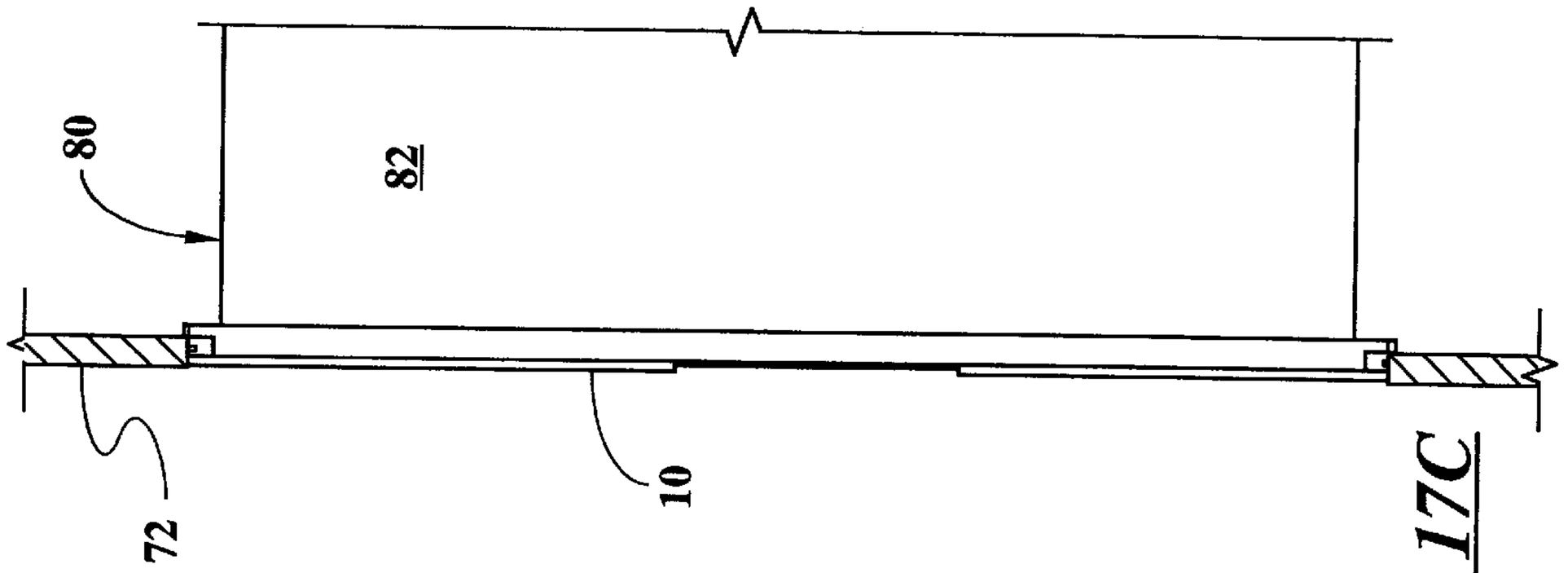


Fig. 17C

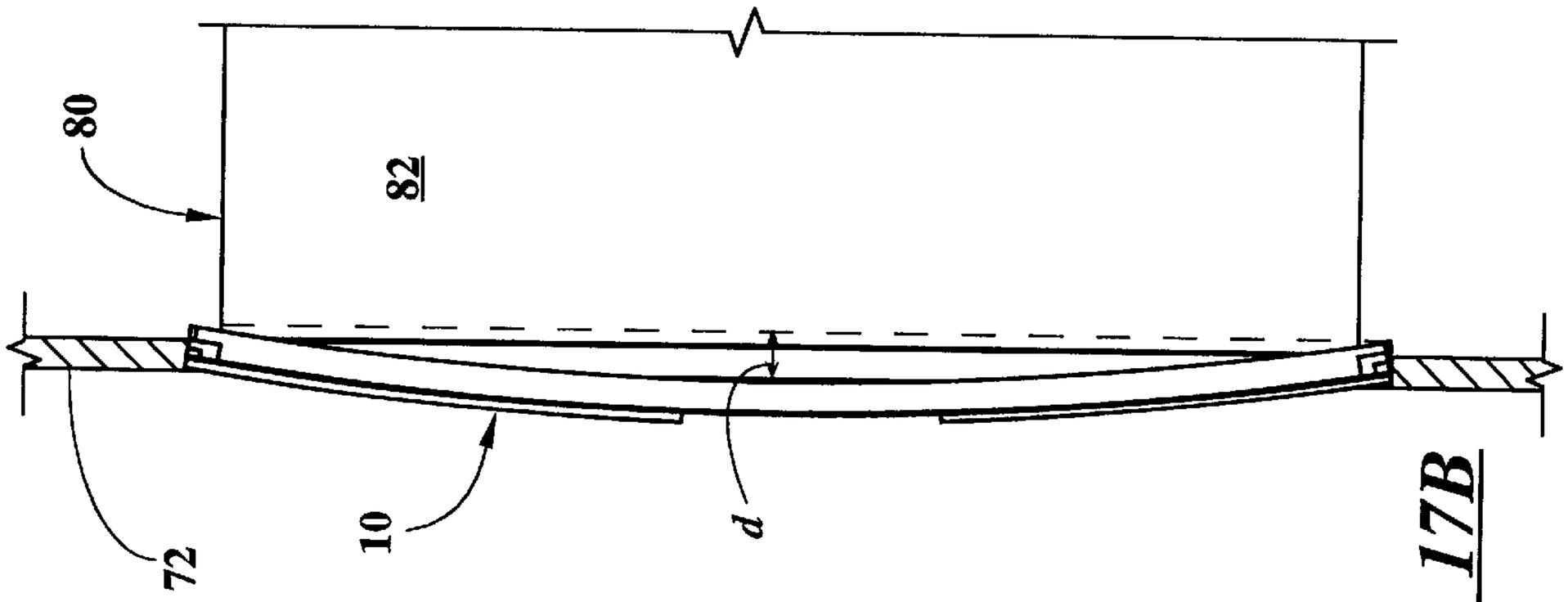


Fig. 17B

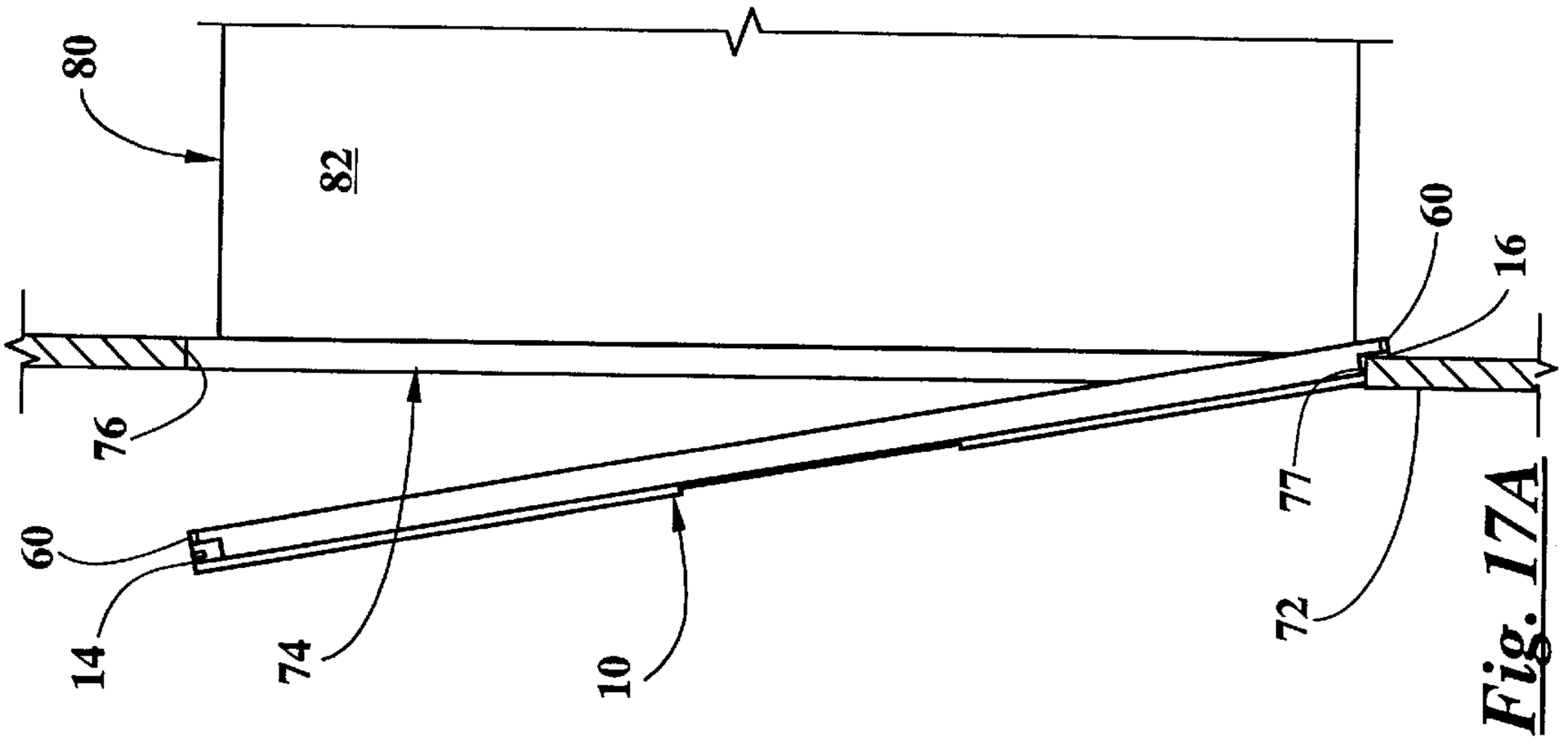
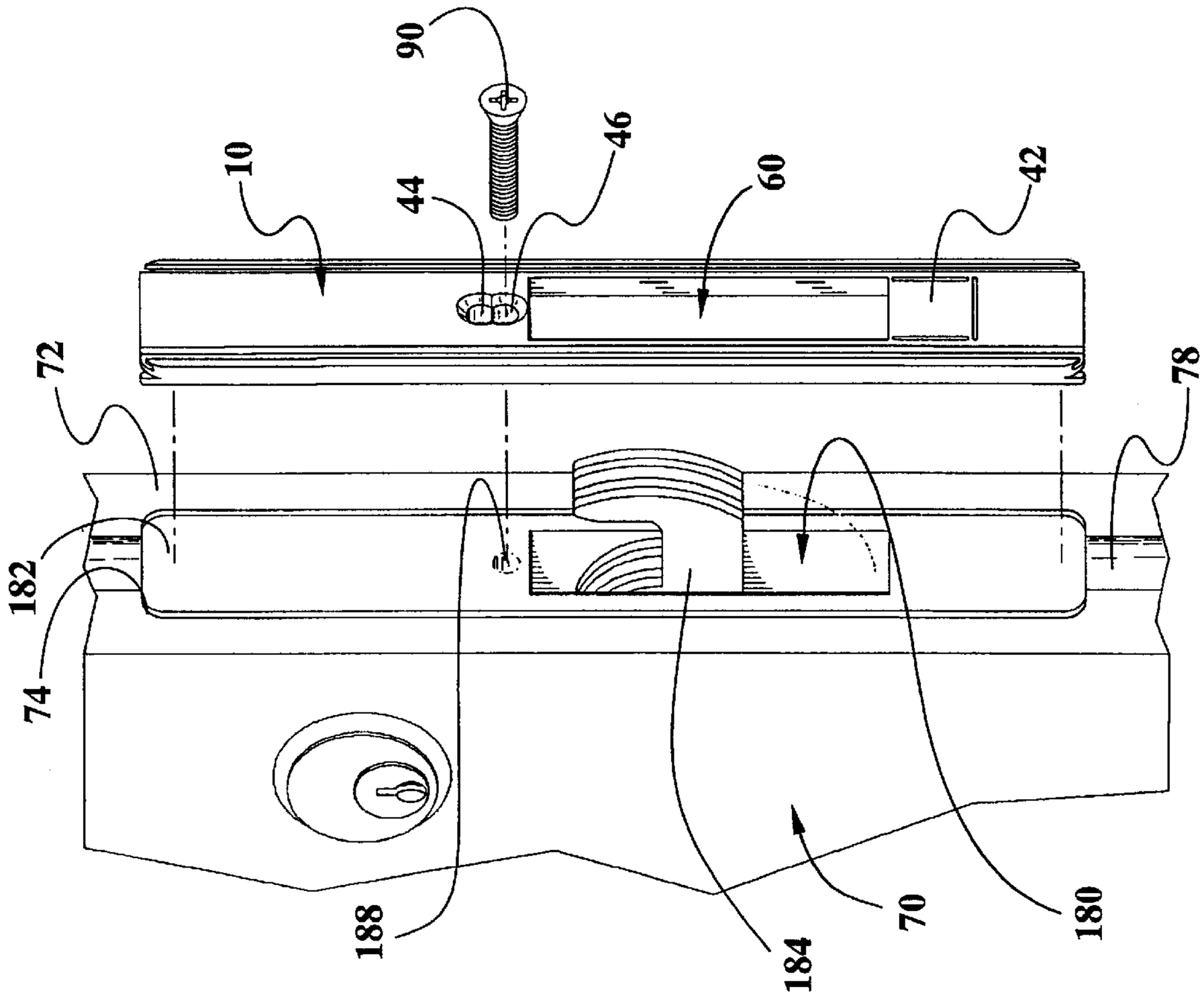


Fig. 17A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42
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182
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188
184
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180

Fig. 19

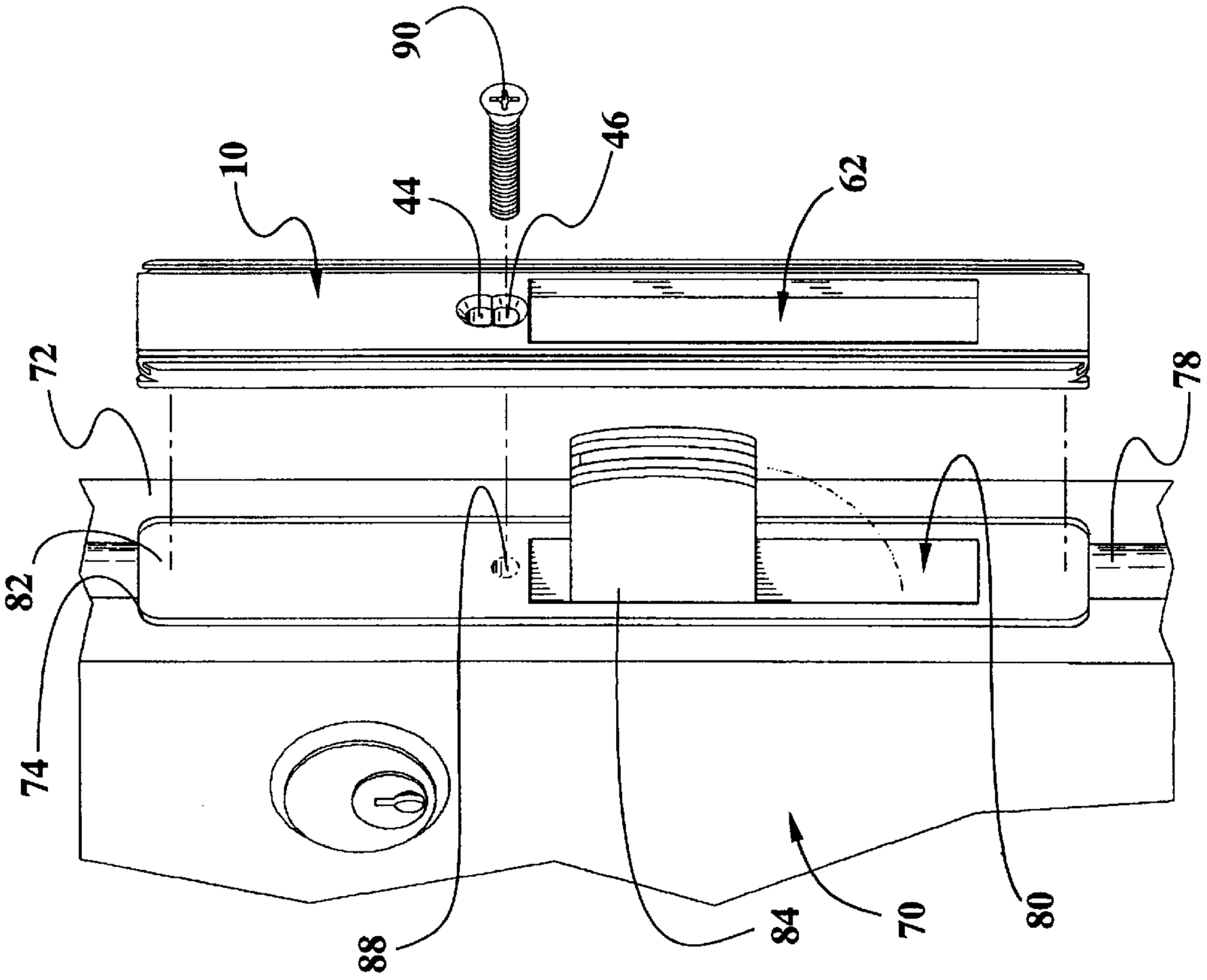
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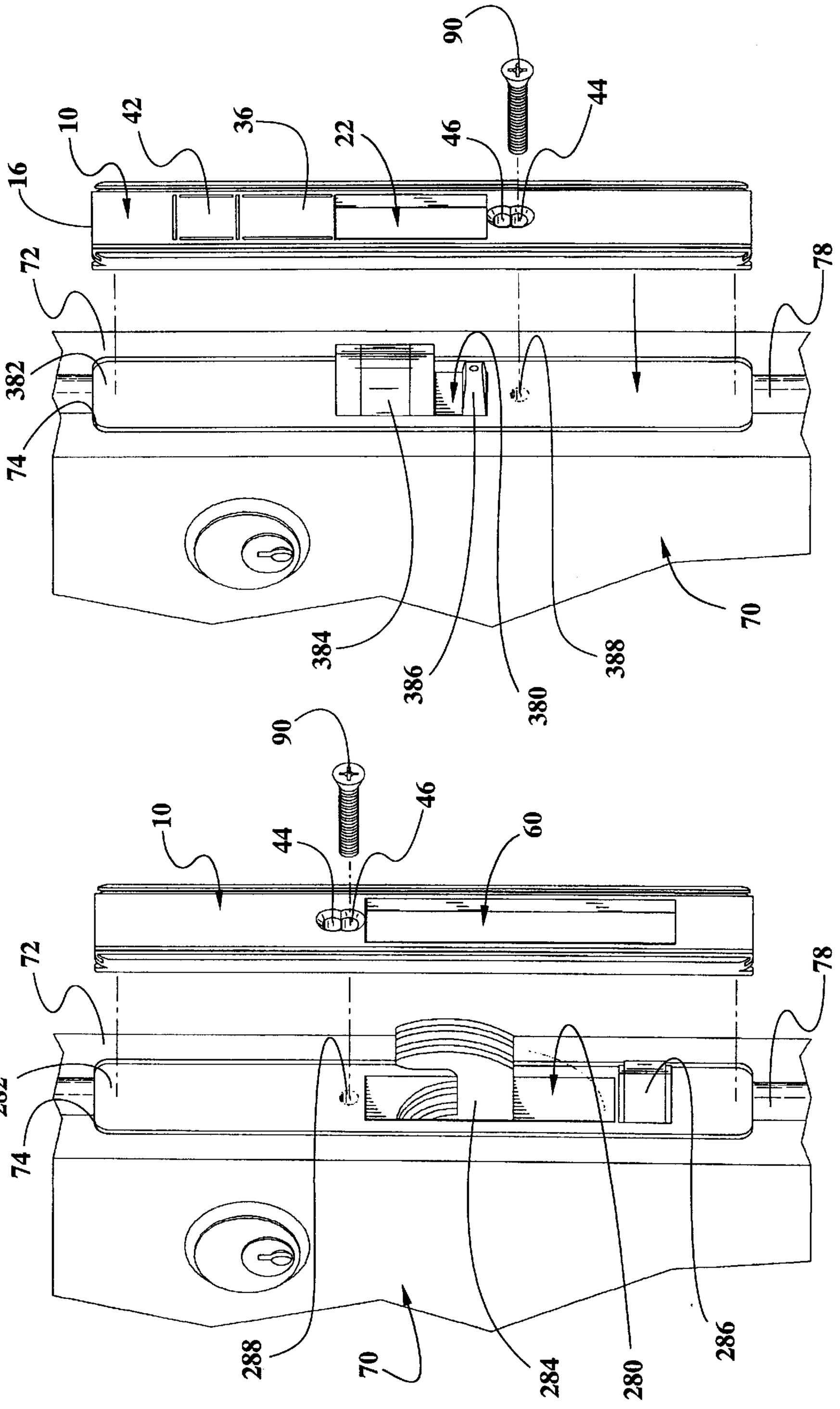
Fig. 18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36
22
16
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78
382
74
384
386
380
388
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90
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46
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60
72
78
282
74
288
70
284
280
286

Fig. 21

Fig. 20

SELF-RETAINING CONFIGURABLE FACE PLATE

TECHNICAL FIELD

The present invention relates generally to face plates for doors. More specifically, the invention relates to a face plate which retains itself in place within a mortise in a door stile and which has a plurality of knock-outs, appropriate ones of which can be removed or left in place to accommodate various lock configurations.

BACKGROUND OF THE INVENTION

To facilitate the mounting of lock hardware, a conventional metal commercial door has a rectangular opening or "mortise" on the lateral vertical edge of the lock stile. Because the lock hardware is inserted into the door through this rectangular opening, the opening must have dimensions approximately as large as the width and height of the door lock hardware. Once the door lock hardware is installed, the entire edge of the hardware is exposed through the rectangular opening in the edge of the door.

To conceal the lock hardware, a face plate is installed within the opening over the exposed edge of the lock hardware. The face plate is configured to fit closely within the opening in the door and fastens to the edge of the lock within the mortise while the threaded fasteners are being installed. Typically three screws are required to secure the top, bottom, and middle of the face plate. Providing screws creates additional handling and inventory demands. In addition, screws can become lost or separated from the faceplate.

Thus there is a need for a face plate which can be held in place on the vertical edge of the lock stile with fewer fasteners, or with no fasteners at all.

The plunger and/or deadbolt engages the door frame through corresponding apertures in the face plate. Because various types of lock hardware, such as long throw deadbolts, short throw deadbolts, hook bolts, and latch locks all have different configurations of plungers and/or deadbolts, each configuration of lock hardware requires a corresponding configuration of face plate.

Thus it would be desirable to provide a face plate which would accommodate a variety of plunger/deadbolt configurations.

SUMMARY OF THE INVENTION

The present invention overcomes these and other problems associated with prior art door lock face plates. Stated generally, the present invention comprises a lock plate which is easily configurable to a variety of plunger/dead bolt configurations. It snaps into place within the mortise in the vertical edge of the door stile and is held there either temporarily—while a screw is installed—or permanently, requiring no screws to hold it in place. Even if a screw is used, only a single screw in the middle of the face plate is required.

Stated somewhat more specifically, the present invention comprises a face plate which includes tabs at its upper and lower edges. When the face plate is mounted within a mortise in a door stile to conceal an edge of a lock mechanism, the back face of the face plate confronts a portion of the housing of the lock mechanism to prevent the face plate from moving inward. The tabs hook behind the vertical edge of the door stile adjacent the upper and lower edges of the mortise to prevent the face plate from moving

outward. The face plate is thus captured within the mortise. Thereafter either the tabs can be relied upon as the only means for holding the face plate in position, or a single fastener in the middle of the face plate can be used, relying on the tabs to hold the upper and lower edges of the face plate in place. The face plate further comprises a plurality of separation lines defining removable portions or "knockouts" corresponding to various lock configurations. Depending upon the configuration of the lock mechanism being used, a corresponding one or combination of the removable portions can be removed to accommodate the particular lock mechanism.

Thus it is an object of the present invention to provide an improved face plate for door locks.

It is another object of the present invention to provide a face plate which can be held in position without fasteners or with fewer fasteners than are conventionally used.

It is a further object of the present invention to provide an improved face plate which can accommodate a variety of configurations of lock mechanisms.

Other objects, features, and advantages of the present invention will become apparent upon reading the following specification, when taken in conjunction with the drawings and the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a front view of a configurable face plate according to the present invention.

FIG. **2** is a side view of the face plate of FIG. **1**.

FIG. **3** is a back view of the face plate of FIG. **1**.

FIG. **4** is a cut-away view along line **4**—**4** of FIG. **3**.

FIG. **5** is a top view of the face plate of FIG. **1**

FIG. **6** is a cut-away view along line **6**—**6** of FIG. **3**.

FIG. **7** is a cut-away view along line **7**—**7** of FIG. **3**.

FIG. **8** is an enlarged partial top view of the area of FIG. **5** indicated by the circle **8**.

FIG. **9** is a side view of a weathering strip for use with the face plate of FIG. **1**.

FIG. **10** is an enlarged partial top view of the area of FIG. **5** indicated by the circle **8** showing the weathering strip of FIG. **9** installed.

FIG. **11** is a front view of the face plate of FIG. **1** showing one knockout removed.

FIG. **12** is a front view of the face plate of FIG. **1** showing two knockouts removed.

FIG. **13** is an edge view of a door stile having a mortise formed therein and having a lock mechanism installed within the mortise.

FIG. **14** is an edge view of the door stile of FIG. **13** showing the face plate of FIG. **1** installed within the mortise to conceal the exposed edge of the lock mechanism.

FIG. **15** is a top view of the door stile, face plate, and lock mechanism of FIG. **14**.

FIG. **16** is an enlarged partial view of the portion of FIG. **14** indicated by the circle **16**.

FIGS. **17**A–C are side cutaway views of the door stile of FIG. **13** showing the installation of the face plate of FIG. **1** within the mortise of the door stile.

FIG. **18** is a perspective view showing the vertical edge of the lock stile of a door having a lock of a first configuration installed therein, with the face plate of FIG. **12** exploded away from the door edge.

FIG. **19** is a perspective view showing the vertical edge of the lock stile of a door having a lock of a second configu-

ration installed therein, with the face plate of FIG. **11** exploded away from the door edge.

FIG. **20** is a perspective view showing the vertical edge of the lock stile of a door having a lock of a third configuration installed therein, with the face plate of FIG. **12** exploded away from the door edge.

FIG. **21** is a perspective view showing the vertical edge of the lock stile of a door having a lock of a fourth configuration installed therein, with the face plate of FIG. **1** exploded away from the door edge.

DETAILED DESCRIPTION OF THE DISCLOSED EMBODIMENT

Referring now to the drawings, in which like numerals indicate like elements throughout the several views, FIGS. **1–8** illustrate a face plate **10** according to the present invention. The face plate **10** has a front face **12**, a back face **13**, a top edge **14**, a bottom edge **16**, and left and right vertical edges **18, 20**. A rectangular aperture **22** is formed in a central portion of the face plate **10**.

The face plate **10** has a plurality of separation lines **25–30** formed therein. The separation lines **25–30** of the face plate **10** comprise narrow, elongated "core out" slots formed through the face plate. The separation lines **25–30** include a first pair of vertical separation lines **25, 26** in vertical alignment with the vertical edges of the rectangular aperture **22** and extending downward therefrom. The upper edges of the first pair of vertical separation lines **25, 26** are spaced slightly downward from the lower edge of the rectangular aperture **22** such that projection legs **31, 32** are formed between the rectangular aperture **22** and the separation lines **25, 26**. A first horizontal separation line **27** is in substantial alignment with the lower edges of the separation lines **25, 26**. The lateral edges of the horizontal separation line **27** are spaced apart from the lower edges of the separation lines **25, 26** to form projection legs **33, 34** between the horizontal separation line **27** and the lower edges of the separation lines **25, 26**. The separation lines **25–27** define a first knockout panel **36**.

The face plate **10** further includes a second pair of vertical separation lines **28, 29** formed in vertical alignment with the first pair of vertical separation lines **25, 26**. The upper edges of the second pair of vertical separation lines **28, 29** are spaced slightly downward from the lower edges of the first pair of vertical separation lines **25, 26** such that projection legs **37, 38** are formed between the separation lines **25, 26** and the separation lines **28, 29**. A second horizontal separation line **30** is in substantial alignment with the lower edges of the separation lines **28, 29**, the lateral edges of the horizontal separation line **30** being spaced apart from the lower edges of the separation lines **28, 29** to form projection legs **39, 40** between the horizontal separation line **30** and the lower edges of the separation lines **28, 29**. The separation lines **28–30** define a second knockout panel **42**.

In the central portion of the face plate **10** a pair of countersunk bores **44, 46** are formed. For convenience of description, and with reference to the center of the face plate **10**, the countersunk bore **44** will be referred to as the "outer" countersunk bore, and the countersunk bore **46** will be referred to as the "inner" countersunk bore. The outer and inner countersunk bores **44, 46** overlap somewhat, such that the bores generally form the shape of the numeral "**8**."

Weathering channels **50** are formed along each of the vertical edges **18, 20** of the face plate **10**. As can be seen in FIG. **8**, each of the weathering channels **50** is shaped like an inverted "T" and has a base **51** and a neck **52** which is narrower than the base **51**.

FIG. **9** depicts a weathering **54** which includes a body portion **55** with nylon pile **56** extending from the body portion **55**. The width of the body portion **55** of the weathering **54** is less than the width of the base **51** of the weathering channel **50** but greater than the width of the neck **52** of the weathering channel **50** such that when the weathering **54** is installed within the weathering channel **50** as shown in FIG. **10**, the weathering cannot become disengaged from the face plate **10** in a direction perpendicular to the face plate **10**.

Referring further to FIGS. **1–8**, rearwardly extending flanges **58** are formed along the vertical edges **18, 20** of the face plate **10** and project rearward from the back of the face plate **10**. A protrusion extends from each end of each of the flanges **58** beyond the upper and lower corners of the front panel **12** to form tabs **60** at the upper and lower edges of the face plate **10**. The forward edge **61** (FIG. **2**) of each tab **60** is offset behind the front face **12** of the face plate **10**. The function and purpose of the flanges **58** and tabs **60** will be explained below.

FIG. **11** shows a face plate **10** with the first knockout panel **36** removed. The first knockout panel **36** is removed by fracturing or cutting projection legs **31–34** to provide an opening **60** defined along its lateral edges by the separation lines **25, 26** and along its lower edge by the separation line **27**.

FIG. **12** shows a face plate **10** with both knockout panels **36, 42** removed. The knockout panels are removed by fracturing or cutting projection legs **31–34** and **37–40** to provide an opening **62** defined along its lateral edges by the separation lines **25, 26, 28,** and **29**, and defined along its lower edge by the separation line **30**.

FIG. **13** shows a door stile **70** having a vertical edge **72**. A mortise or cut-out **74** is formed in the vertical edge **72** of the door stile **70**. The mortise **74** is generally rectangular in shape and has rounded corners **75**. The mortise **74** has an upper edge **76** and a lower edge **77**. A weathering channel **78** for receiving a weather strip. (not shown) runs vertically along the edge **72** of the door stile **70**.

Shown mounted within the mortise **74** in the vertical edge **72** of the door stile **70** is a lock mechanism **80**. The lock mechanism includes a housing **82**. A pair of lock cylinders **83** are also shown in the drawings, though it will be appreciated that one of the cylinders **83** can be replaced by a thumb latch or the like, depending upon the particular application. The lock mechanism **80** further includes a dead bolt **84**. Threaded holes **88** are provided in the housing **82** to receive screws for fastening a cover plate.

FIGS. **14** and **15** show the vertical edge **72** of the door stile **70** with a face plate **10** mounted within the mortise **74** to conceal the lock mechanism. The face plate **10** has both knockout panels **36, 42** removed to accommodate the dead bolt **84** of the lock mechanism. The back face **13** of the face plate **10** bears against the housing **82** of the lock mechanism **80**. The top and bottom edges **14, 16** of the face plate **10** are held in place by means of the tabs **60** fitting behind the vertical edge **72** of the door stile **70** adjacent the upper and lower edges **76, 77** of the mortise **74**. The central portion of the face plate **10** is held in place by a screw **90** inserted through the outer countersunk bore **44** in the face plate and threaded into the center threaded hole **88** (FIG. **14**) in the housing **82** of the lock mechanism **80**.

With reference specifically to FIG. **15**, the dead bolt **84** of the lock mechanism **80** can be extended to engage a door jamb **92**. Weathering **54** mounted to the face plate **10** contacts the door jamb **92**.

FIG. **16** is an enlarged view showing a tab **60** extending beyond the mortise **72** to hook behind the vertical edge **72** of the door stile **70**.

FIGS. **17**A–C illustrate the procedure for installing a cover plate **10** within the mortise **74** in the vertical edge **72** of the door stile **70**. Referring first to FIG. **17**A, the bottom edge **16** of the face plate **10** is positioned against the lower edge **77** of the mortise **74** with the tabs **60** at the bottom edge of the face plate fitting behind the vertical edge **72** of the door stile **70**. Then, as shown in FIG. **17**B, the face plate **10** is bowed by a distance d so that the tabs **60** at the top edge **14** of the face plate clear the upper edge **76** of the mortise **74**. As shown in FIG. **17**C, the tabs **60** at the top edge **14** of the face plate **10** then hook behind the vertical edge **72** of the door stile **70** just above the upper edge **76** of the mortise **74**. In this position, the face plate **10** is prevented from moving outward by the tabs **60** hooked behind the vertical edge **72** of the door stile **70**, and the face plate **10** is prevented from moving inward by the housing **82** of the lock mechanism **80**. Thus, the face plate **10** is held in place even without the benefit of a screw. Thus if desired the mounting screw **90** can be eliminated, and with it the need for the pair of countersunk bores **44**, **46** in the face plate **10**.

FIGS. **18–21** illustrate how removing various combinations of knock-outs **36**, **42** enables the face plate **10** to accommodate various configurations of latches and deadbolts. Referring to FIG. **18**, mounted to the door stile **70** is a door lock mechanism **80** marketed by Adams Rite Manufacturing Co., of City of Industry, California., under the designation Deadlock Series MS1850A. The Deadlock Series MS1850A includes a housing **82** and a bolt **84** which pivots upwardly into engagement with a strike (not shown) on the door frame. To accommodate this pivoting action of the bolt **84**, both knockouts **36**, **42** are removed from the face plate **10** to provide a large central opening **62**. The face plate **10** is positioned within the mortise **74** in the vertical edge **72** of the door stile **70**, the central opening **62** clearing the bolt **84** of the door lock mechanism **80**. A screw **90** is inserted through the inner bore **46** and threaded into a bore **88** in the housing **82** of the lock mechanism to secure the face plate **10** to the door **70**.

FIG. **19** illustrates a door stile **70** to which is mounted an Adams Rite Deadlock Series MA1850A-050 lock mechanism **180**. The Deadlock Series MA1850A-050 lock mechanism **180** comprises a housing **182** and a lock bolt **184** which is hook-shaped and swings up into engagement with a strike in the door frame (not shown) in an arcuate path. To accommodate the arcuate action of the lock bolt **184**, the first knockout **36**, but not the second knockout **42**, is removed from the face plate **10** to create a central opening **60**. The face plate **10** is positioned within the mortise **74** in the edge **72** of the door stile **70**, the central opening **60** clearing the lock bolt **180** of the door lock. A screw **90** is inserted through the inner countersunk bore **46** and threaded into a hole **188** in the housing **182** of the lock mechanism **180** to secure the face plate **10** to the door stile **70**.

Referring now to FIG. **20**, mounted to the door **70** is an Adams Rite Latch/Lock Series MS+1890 lock mechanism **280**. The lock comprises a housing **282**, a lock bolt **284**, and a latch bolt **286**. As in the lock mechanisms **80**, **180** previously described, the lock bolt **284** swings up into engagement with the strike in an arcuate path. To accommodate the latch bolt **286** and the arcuate action of the lock bolt **284**, both knockouts **36**, **42** are removed from the face plate **10** to create a large central opening **62**. The face plate **10** is positioned within the mortise **74** in the edge **72** of the door **70**, the central opening **62** clearing the lock bolt **284** and latch bolt **286** of the lock mechanism **280**. A screw **90** is inserted through the inner bore **46** and threaded into a hole **288** in the housing **282** of the lock mechanism **280** to secure the face plate **10** to the door **70**.

With reference to FIG. **21**, an Adams Rite Heavy Duty Deadlatch Series **4710** lock mechanism **380** is mounted within the door stile **70**. The lock mechanism **380** includes a housing **382**, a spring-loaded latch bolt **384**, and an auxiliary bolt **386**. The configuration of the latch bolt **384** and auxiliary bolt **386** is relatively compact, such that the face plate **10** can be installed over the lock without having to remove either of the knockouts **36**, **42**. The face plate **10** is positioned within the mortise **74** in the edge **72** of the door **70**, the central opening **22** clearing the latch bolt **384** and auxiliary bolt **386** of the door lock. Because of the particular lock configuration, however, the face plate **10** is inverted from its normal orientation such that the edge previously identified as the lower edge **16** is located at the upper end of the face plate. To accommodate the inverted orientation of the face plate **10**, the threaded hole **375** is mounted below the opening **378**. To secure the face plate **10** to the door stile **70**, a screw **90** is inserted through the outer bore **44** and threaded into a bore **388** in the housing **382** of the lock mechanism **380**. It will be noted that, in contrast to the threaded bores **88**, **188**, and **288** of the previously disclosed embodiments, the threaded bore **388** is located beneath the bolts **384**, **386**.

In the disclosed embodiment the face plate **10** is molded from molded nylon or other suitable materials. If desired, the material from which the face plate **10** is molded may be provided in a color which will match the color of the door within which it is to be installed to eliminate the need for painting the face plate. Also in the disclosed embodiment, the exposed exterior surface of the face plate **10** is preferably provided with a non-glare or matte finish, such as by stippling or salinization.

Also in the disclosed embodiments, the separation lines **25–30** comprise core out slots, that is, a complete interruption through the face plate **10**. However, it will be appreciated that other forms of separation lines can be provided, including scored lines which form lines of weakness along which the cover can be fractured or cut to separate the knockout panels from the cover.

While the foregoing embodiments have been described with respect to particular locks marketed by a specific company, it will be understood that these locks are identified for illustrative purposes only and that the invention is not limited to a face plate for use with any particular lock. The fundamental principle of this aspect of the invention is that the face plate **10** can be modified to accommodate a particular lock configuration, in contrast to the prior art approach of designing the face plate specifically for the particular lock configuration.

Finally, it will be understood that the preferred embodiment has been disclosed by way of example, and that other modifications may occur to those skilled in the art without departing from the scope and spirit of the appended claims.

What is claimed is:

1. An apparatus for use with a lock mechanism and a door for concealing an exposed edge of the lock mechanism when the lock mechanism is installed within an opening in a vertical edge of a stile of the door, comprising:

a face plate having a width, first and second longitudinal edges, and a central opening;

a plurality of separation lines formed in said face plate and defining at least one knockout portion having a width which is less than said width of said face plate, said

knockout portion being removable at the option of a user to accommodate a particular configuration of lock mechanism;

said face plate further comprising a weathering channel for mounting a weathering strip to said face plate, said weathering channel being formed adjacent said first longitudinal edge of said face plate and extending between said first longitudinal edge and an adjacent separation line;

whereby said knockout portion can be removed from said face plate without interrupting said weathering channel.

2. The apparatus of claim **1**, wherein said face plate further comprises a second weathering channel for mounting a weathering strip to said face plate, said second weathering channel formed adjacent said second longitudinal edge of said face plate and extending between said second longitudinal edge and an adjacent separation line;

whereby said knockout portion can be removed from said face plate without interrupting either of said weathering channels.

3. An apparatus comprising:

a door having a stile, said stile of said door having a vertical edge, and said vertical edge of said stile having an opening therein;

a lock mechanism mounted within said opening in said vertical edge of said stile of said door, said lock mechanism having an outer edge facing said opening in said vertical edge of said stile;

a face plate configured to fit within said opening in said vertical edge of said door stile, said face plate having upper and lower edges, and said face plate having a back face which confronts an adjacent portion of said lock mechanism when said face plate is installed within said opening;

an upper tab at said upper edge of said face plate; and

a lower tab at said lower edge of said face plate, each of said upper and lower tabs being configured to hook behind said door stile when said face plate is installed within said opening so as to retain said face plate in place, and said face plate being retained in position by way of an interference fit between said lock mechanism and said door stile;

whereby said face plate conceals said outer edge of said lock mechanism.

4. The face plate of claim **3**, wherein said face plate is generally rectangular, wherein said upper tab comprises a first upper tab, and wherein said lower tab comprises a first lower tab, said apparatus further comprising a second upper tab at said upper edge of said face plate and a second lower tab at said lower edge of said face plate such that a tab is disposed adjacent each corner of said generally rectangular face plate.

5. The face plate of claim **3**, wherein said face plate comprises a front face, wherein each of said tabs comprises a forward edge, and wherein said forward edge of each of said tabs lies in a plane which is rearward of said front face of said face plate.

6. An apparatus comprising:

a door having a stile, said stile of said door having a vertical edge, and said vertical edge of said stile having an opening therein;

a lock mechanism mounted within said opening in said vertical edge of said stile of said door, said lock mechanism having an outer edge facing said opening in said vertical edge of said stile;

a face plate having a panel configured to fit within said opening in said vertical edge of said door stile and substantially coplanar with said vertical edge of said door stile, said panel having upper and lower edges, and said panel having a back face which confronts an adjacent portion of said lock mechanism when said face plate is installed within said opening; and

an upper tab at said upper edge of said face plate; and

a lower tab at said lower edge of said face plate, each of said upper and lower tabs being configured to hook behind said door stile when said face plate is installed within said opening so as to retain said face plate in place,

said face plate being retained in place by an interference fit, constrained from being displaced outward by said tabs, constrained from being displaced inward by said adjacent portion of said lock mechanism, and constrained from being displaced vertically and laterally by said opening in the door.

7. The face plate of claim **6**, wherein said panel comprises a front face, wherein each of said tabs comprises a forward edge, and wherein said forward edge of each of said tabs lies in a plane which is rearward of said front face of said panel of said face plate.

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